INSECT REPELLENT PRODUCTS

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Biting insects, mites and ticks are a part of our environment. Whether we are hiking in woodlands or gardening in our backyard, we are potentially exposed to these pests. These bloodsucking animals are attracted to people by a number of chemical and physical factors, including carbon dioxide from our breath, body heat and, chemicals in our sweat and on the surface of our skin. Certain colors and textures of clothing and, even the odor from soaps, perfumes, lotions and hair care products may attract mosquitoes and some biting flies. When used sensibly, repellents will provide some personal protection from biting insects and mites. The following information is presented to answer some commonly asked questions about repellents and mechanical devices that allegedly repel insects and ticks.

Topically applied repellents

A variety of chemicals have been used to repel biting insects and other arthropods such as ticks and mites; however, the two most commonly used active ingredients are N,N-diethyl-meta-toluamide (DEET) and ethyl hexandiol. DEET repels a greater variety of insects than ethyl hexandiol, and DEET is generally recognized as the most effective active ingredient in repellents. Mosquitoes, chiggers and ticks are readily repelled by formulations containing DEET. By comparison, deer flies and horse flies are less sensitive to the chemical, but satisfactory relief from these noxious pests may be obtained if the repellent is applied liberally. Repellents may interfere with the insect’s ability to detect attractant chemicals that animals produce or they may prevent biting insects from landing. However, they may not keep insects from swarming around prospective victims. Effective repellent products should several hours of protection if they are not washed off by rain or sweat. Here are some other key points about using DEET:
A variety of repellent formulations can be purchased from retail stores. As a general "rule of thumb", repellents containing from 10-35% DEET in the desired formulation (lotion, pump and aerosol sprays, etc.) should be effective.

Apply the repellent to exposed skin and clothing (that insects can bite through). Do not apply it to skin under clothing; this increases the absorption of the chemical into the skin. Never apply repellent to cut or abraded areas on the skin.

Avoid repeated application of repellents containing more than 50% DEET to skin over a short period of time.

For children, use products that contain no more than 10% DEET. Use them sparingly on children under 6 years old and do not apply DEET repellents to children under the age of two.

Do not allow children to handle the chemical, apply it to them yourself. Do not put it on a child's hands, which often wind up in the eyes or mouth.

Be careful when applying repellents to yourself. Repellents sprayed directly into the eyes will cause irritation and some formulations may damage eye glasses or other synthetic materials. Apply the chemical to your hands then carefully rub it onto your face.

After returning indoors, wash treated skin with soap and water or bathe. This is particularly important when repellents are used repeatedly in a day or on consecutive days. Also, wash treated clothing before wearing it again.

If you suspect that you or your child have a reaction to an insect repellent, discontinue its use immediately, wash the treated skin and then call your local poison control center. If you go to a doctor, take the repellent container with you so the doctor can review the label information.

Another common repellent is Permanone, which contains the fast-acting insecticide permethrin. Permanone is applied to the clothing only (not to your skin) and will repel most mosquitoes and biting flies, as well as fleas, ticks and chiggers.

Some body lotions have been reported to repel biting insects. The ingredients in these lotions do not possess any repellent properties. Instead, the mineral oil in these products creates a barrier film that prevents the insect's mouthparts from penetrating the skin. These lotions are most effective against sand flies ("no-see-ums") and other biting insects with short mouthparts.

**Other repellent chemicals**

Oil of Citronella, which is extracted from *Andropogon nardus*, has been used as a mosquito repellent since 1882. “Citronella candles” are commonly burned outdoors to repel mosquitoes and other biting insects from around porches, decks and picnic areas. The candles will be most effective when there is relatively little air movement that might disperse volatile chemicals too quickly.

**Systemic repellents**

Vitamin B1 (thiamine chloride), garlic, brewer's yeast and other plant-based chemicals have been reported to repel mosquitoes when taken orally. Some of these materials are marketed in tablet form, and the
manufacturers claim that protection from mosquitoes will last up to 24 hours after taking one tablet. To date, the results of several scientific studies do not support the claims that these materials are effective repellents for mosquitoes or other biting insects, mites or ticks.

**Repellent Plants**

In recent years, plants such as *Citrosa* have been promoted as having mosquito repellent properties. These plants contain many of the same chemicals found in oil of citronella. However, results of scientific studies of these plants have not supported the claims of effective mosquito-repellence in outdoor areas.

**Electronic pest repellers**

A variety of battery powered ultrasonic pest repelling devices (e.g., flea/tick collars, hanging or pocket devices for mosquitoes) can be purchased from retail outlets or mail order companies. Manufacturers allege that the high frequency sound emitted by these devices "repel" mosquitoes, ticks, fleas and even cockroaches. Scientific tests of these devices do not indicate that they repel or reduce the attack of biting insects, ticks or mites, nor do they eliminate cockroach infestations.